Impact of physician self-referral on use of imaging services within an episode

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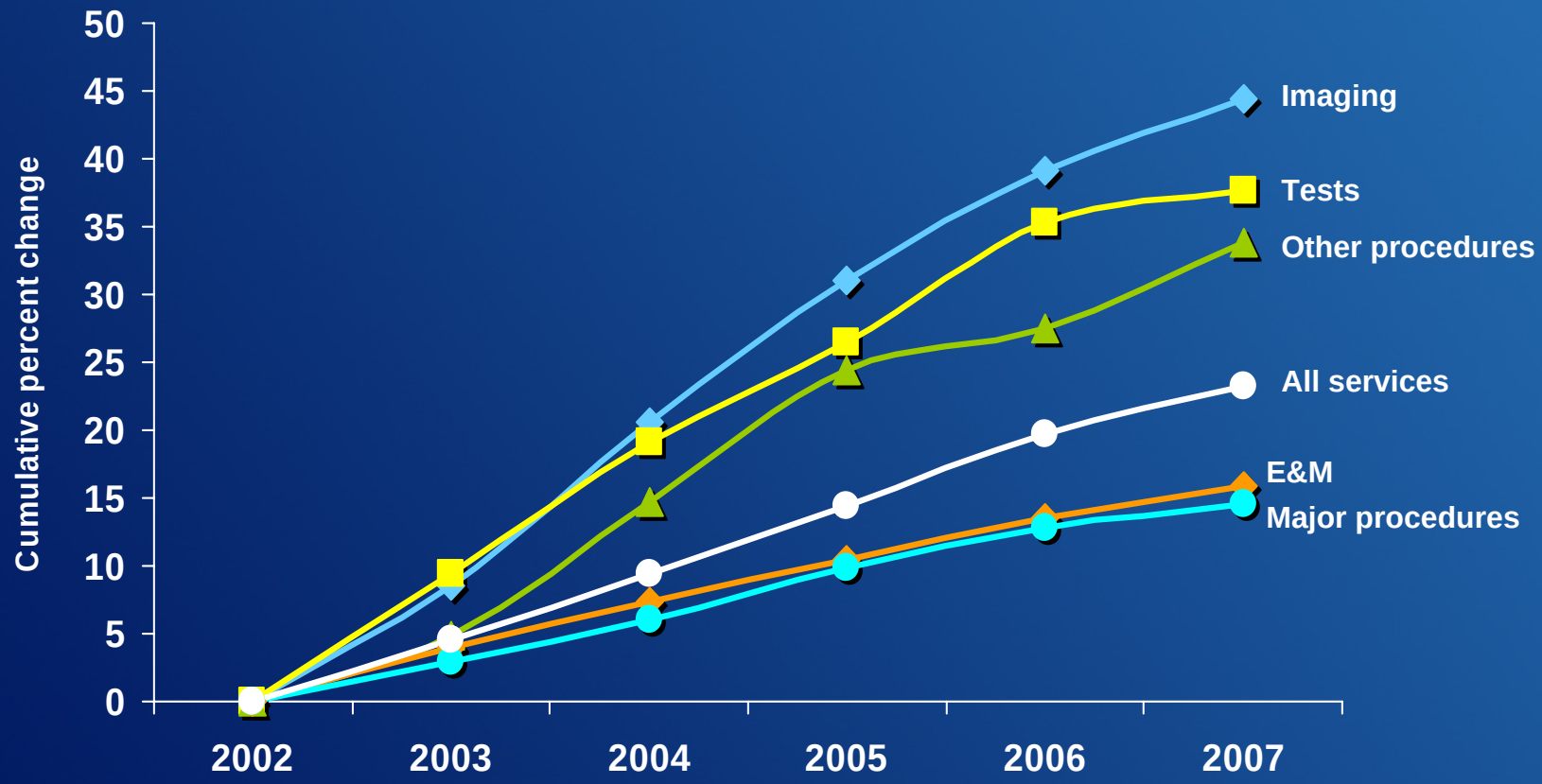
Outline

- Prior Commission work
- Growth of imaging
- In-office imaging
- Methodology and results of 2 studies
  - Impact of self-referral on use of imaging
  - Do episodes with more imaging have lower total costs?

Prior Commission work on imaging

- Recommended quality standards for all providers (2005)
- Recommended changes to improve payment accuracy (2005, 2009)
- Expert panels discussed appropriateness criteria, prior authorization, and self-referral (2007, 2008)

Volume of imaging services per beneficiary growing faster than other physician services

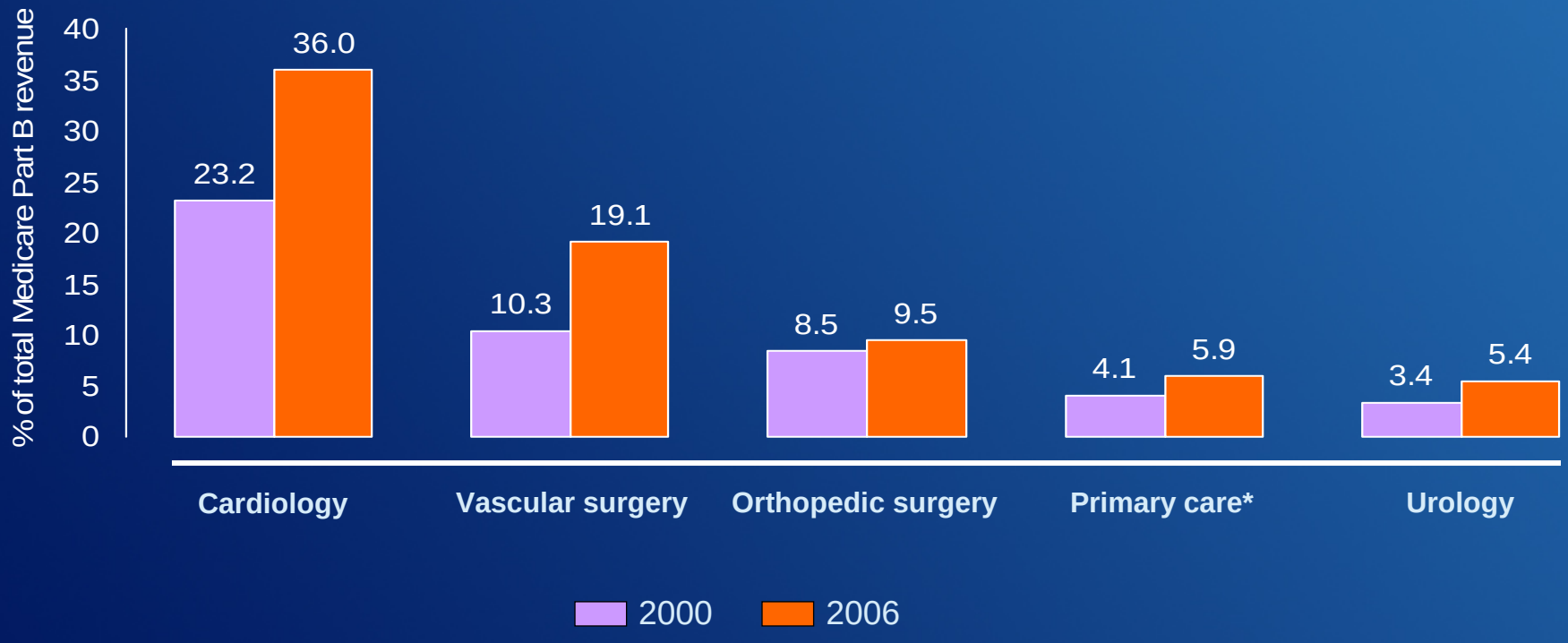


Note: E&M (evaluation and management).
Source: MedPAC analysis of claims data for 100 percent of Medicare beneficiaries.

Increase in imaging likely driven by multiple factors

- Technological innovation
- Incentives in Medicare's payment systems
- Defensive medicine
- Consumer demand
- Lack of research on the impact of imaging on clinical decision-making and outcomes
- Inconsistent adherence to clinical guidelines
- Physician ownership of imaging equipment

Increase in share of revenue from in-office imaging, by specialty



Source: GAO analysis of Medicare Part B claims data, 2008.

*Includes general and family practitioners and internists.

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In-office imaging offers benefits but also raises concerns

- Benefits
  - Patients more likely to receive imaging on same day as office visit (Gazelle et al. 2007)
    - E.g., 12% of patients of self-referring physicians received same-day nuclear medicine study, vs. 5% of other patients
  - Physicians can obtain test results faster
- Concerns
  - Could lead to higher overall volume through greater capacity, financial incentives to refer patients for additional tests
  - Several studies find that physician self-referral associated with greater use of imaging

Limitations of prior studies

- Most studies based on older data
- Only 2 studies controlled for differences in patients' clinical conditions
- Only 1 study examined whether physicians refer patients to other members of their practice
- None examined imaging *spending* during an episode of care

Methodology for our study: Defining self-referring physicians

- 100% Medicare claims for 6 markets (Boston, Greenville, Miami, Minneapolis, Orange County, Phoenix)
- Primary definition of self-referring physicians: refer more than half of their patients to their practice for imaging
- Rule applied separately to each imaging modality
- Assume that physicians who share same tax number are in same practice

Used Episode Treatment Group software

- ETGs group claims into clinical episodes
  - Within ETG, episodes stratified based on comorbidities, complications, treatment, patient severity
- Criteria for selection of ETGs for study
  - Imaging accounts for significant share of overall resource use
  - Represent broad range of conditions and modalities
  - Treated by variety of specialties
- Selected 1 or 2 imaging modalities for each ETG (22 ETG-modality pairs)

ETGs and imaging modalities selected for analysis

Episode Treatment Group	Primary imaging modalities
Cerebral vascular accident	MRI: brain, CT: head
Spinal trauma	MRI: other
Migraine headache	MRI: brain
Ischemic heart disease	Echocardiography, nuclear medicine
Congestive heart failure	Echocardiography, nuclear medicine
Valvular disorder	Echocardiography, nuclear medicine
Malignant neoplasm of pulmonary system	CT: other
Kidney stones	CT: other
Joint degeneration, localized—back	MRI: other, standard imaging
Joint degeneration, localized—neck	MRI: other, standard imaging
Joint derangement—knee and lower leg	MRI: other, standard imaging
Bursitis and tendonitis—shoulder	MRI: other, standard imaging
Other minor orthopedic disorders—back	MRI: other, standard imaging

Defining self-referral episodes

- Self-referral episodes: At least one physician who met definition of self-referral provided an office visit during episode
- Non self-referral episodes: No physician who met definition of self-referral provided an office visit

Compared self-referral with non-self-referral episodes

- Percent of episodes that received at least one imaging service
- Ratio of observed to expected (O/E) imaging spending
  - Observed = spending for that episode
  - Expected = average spending for episodes with same ETG, patient severity level, MSA, physician specialty
- 2005 data

Episodes with self-referring physician more likely to receive at least one imaging service

- Relationship between self referral and imaging use is uniformly positive for all ETGs studied
- Episodes with self-referring physician are 2 to 23 percentage points more likely to receive an imaging study
  - Magnitude varies depending on ETG and imaging modality
  - E.g., 14% of migraine episodes with self-referring physician had an MRI, vs. 8% of episodes with non-self-referring physician
- Difference is statistically significant for 21 of 22 ETG-modality pairs

Episodes with self-referring physician had higher ratios of observed to expected imaging spending, by ETG and modality

- Episodes with a self referring physician had 5% to 104% higher imaging spending than episodes without self referring physician (adjusting for ETG, modality, patient severity, MSA, physician specialty)
- E.g., migraine episodes with a self-referring physician had 85% more spending on MRIs than episodes with no self-referring physician

Our findings are comparable to recent prior studies

- Gazelle et al. (2007): Self-referring physicians order imaging 10% to 130% more frequently than other physicians (per episode)
- Baker (2008): After an orthopedic surgeon or neurologist acquires an MRI machine, patients are 22% to 28% more likely to receive MRI scan (per office visit)
- Older studies from the 1990s find even larger differences

Do episodes with more imaging have lower total costs?

- Evidence that imaging in specific circumstances prevents surgeries, reduces hospital costs (e.g., use of CT for appendicitis or acute stroke)
- Do these examples translate into broader savings for an entire episode?
- If so, we'd expect negative correlation between imaging spending and total episode spending
- Tested hypothesis with 13 ETGs, 2005 data

Higher imaging spending is not correlated with lower total episode spending

- Imaging spending positively correlated with total episode spending (0.19-0.60)
- Suggests that more imaging associated with greater use of all services during episode (adjusting for condition, patient severity, MSA)
- Imaging spending also positively correlated with procedure spending (0.06-0.20)

Comparing our analysis of imaging and total episode spending with other studies

- We analyzed impact of imaging on total spending within episode; studies that found savings examined impact more narrowly (e.g., impact on hospital costs and length of stay)
- We examined 13 ETGs; relationship between imaging and total spending may be different for other conditions (e.g., appendicitis)

Discussion

- Comments on our findings
- Additional analyses
- Policy options